Extraction of Calpurnia aurea (CA) root phytochemical screening for detection and usage of glycosides

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Abstract

In Ethiopia, Calpurnia aurea (CA) is utilized for several diseases like syphilis, malaria, rabies, diabetes ect. Researchers assessed the photochemical screening like flavoides, saponins glycosides ect., are used for standard methods in vitro antioxidant properties that are screened by DPPH. Calpurnia aura leaves are dried seeds that are collected by south Gondar, northern Ethiopia collets the plant materials that are dried and powdered utilizing electric grinder. Here major part of CA are utilized in pharmaceutical industry for the evidence of study by highest therapeutic efficiency processing by major metabolic classes contains more alkaloids and tannins of CA leaves. Here many medical plants are helpful for healing and curing human disease on the presence of phytochemical constituents so it is used in many Auyurvedic medicines. This is safe, less toxic, economical and reliable under indigenous systems of medicine.

Keywords: CA; phytochemicals; Screening of Phytochemical; Qualitative examination; Standard approaches

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1 Introduction

So as to advance home grown medications, there is an earnest need to assess the restorative possibilities of the medications according to WHO rules and referenced that 30% of the overall deals of medications depends on characteristic products1. Conventional indigenous medication is restricted to little ancestral and topographical regions known as "Little Traditions” have been a phenomenal store over information regarding therapeutic properties of the natural resources. Moreover, the dynamic concentrate ought to normalize based on photochemical mixes. PS of restorative plants has been significant in the distinguishing novel wellsprings of the remedially and mechanically significant compounds2. It is basic to start a critical advance aimed at
plants screening for auxiliary MB. Moreover, current correspondence endeavors for surveying the highlight of photochemical characteristics of therapeutic plants for enhancing the wellbeing score of individuals and furthermore for utilizing in drug results over business significance in world\textsuperscript{3}.

CA is a sort of Plants of Flowering inside group fabaceae\textsuperscript{4}. Furthermore, variety involves bushes otherwise little trees in otherwise all over the edge woods of numerous pieces of the Ethiopia and generally dispersed in Africa from the province of cape for Eritrea and that additionally happens in India\textsuperscript{5}. Writing overview exposes which, entire pieces of plant species is been utilized aimed at various human and creature disease\textsuperscript{6}. Moreover, local nations such as Ethiopia, customarily, leave and powdered underlying foundations of CA is utilized aimed at the intestinal sickness, , diabetes, hypertension , lung TB, rabies the runs, , trachoma, leishmaniasis\textsuperscript{7}, elephantiasis, parasitic maladies, swellings in various, stomach-hurt, entrail, issues of bladder, for decimate worms, for obliterate lice, for soothe tingles, utilized in the form of poison fish or in the form of solution aimed at looseness of the bowels, show movement in averse togiardiasis and amoebiasis and, hack and snake bite\textsuperscript{8,9}. Plant essential for phytomedicines for days of yore Furthermore, These could be gotten aimed at any aspect of plant such as blossoms, leaves, bark of stem, root and finally seeds i.e., any aspect of plant might comprise dynamic parts.

Along these lines, here in this current examination, subjective phytochemical investigation of root concentrates of CA has been screened by utilizing benchmarking strategies. Further, trust, which discoveries from this contribution might accumulate to general estimation of therapeutic capability of plant.

Aim of the study:

Calpurnia aurea (CA) is utilized for several diseases like syphilis, malaria, rabies, diabetes ect. Researchers assessed the photochemical screening like flavoides, saponins glycosides ect., are used for standard methods in vitro antioxidant properties that are screened by DPPH. CA leaves are dried seeds that are collected by south Gondar, northern Ethiopia collets the plant materials that are dried and powdered utilizing electric grinder. Here major part of CA are utilized in pharmaceutical industry for the evidence of study by highest therapeutic efficiency processing by major metabolic classes contains more alkaloids and tannins of CA leaves. Here many medical plants are helpful for healing and curing human disease on the presence of phytochemical constituents so it is used in many Auyurvedic medicines

2 Materials and Methods

Collection and Identification

The plant test of the investigation was gathered from around Jimma Arjo good country (East Wollega Zone, around 50 km away from Nekemte town toward the south-west heading, Western Ethiopia) and the character of the plant was affirmed by natural researchers from Wollega University Biological Science Department with the reference of National Museums of Ethiopia Herbarium. Proper voucher example assigned was stored at
the School of Botanical science, Wollega University.

**Mining:**
Moreover, entire part of root has been washed in faucet water and slice has been converted to little pieces for encouraging. In wake of gauging wet example, the air, which is hot stove dried beneath 55°C aimed at 14 h until it comes as consistent mass. At that point primer qualitative dampness distinction has been determined and total dry example has been powdered for reasonable size 1st root bark and internal section independently, and afterward homogenized. Furthermore, powdered example has been put away china holder. Also, readied gauged powder and afterward macerated through utilizing 4 natural as indicated by expanding extremity record over the hours of 72 for shaking mechanically inside 4 hrs span over normal and it has been sifted through channel paper and their filtrate has been dried utilizing evaporator Rotary.

**Screening of Phytochemical:**
Once the arrangement of standard and special Solutions, primary subjective screening of phytochemical has been done after strategies depicted in various articles performed by numerous authors\(^\text{10-14}\).

**Alkaloids:**
Test of Wagner’s: over 10 mg of concentrate has been considered and drops of 3-5 of reagent called Wagner’s have been included and development of ruddy earthy colored hasten demonstrates the presence of alkaloids. Ruddy earthy colored hued hasten demonstrates alkaloids existence.

**Test of Hager’s:**
various dissolvable 0.2g concentrates of CAhave been incorporated every cylinder test and hexane of 3mL have been blended in every one of it, shaken well and sifted. At that point 5 mL of 2% HCl was taken and poured in every test tube possessing the blend of plant concentrate and hexane. Each test tubes possessing the blend had been warmed, sifted and barely any drops of picric corrosive arrangement were filled every blend in TT. Arrangement of Coloryellow accelerate is considered to be pointer of alkaloids existence. The shading of yello hasten demonstrates the alkaloids existence.

**Flavonoids:**
**Test of Shinoda:**
Concentrate having 10mg has been accumulated for attaining tunings mg and concentrated hydrochloric acid 3 drops has been incorporated. Organization of tone orange-pink exhibits flavonoids existence.

**Alkaline NaOH Test Reagent:**
Unsolved concentrate has been blended with NaoH of 2ml. The intricate shading of yellow has been shaped that turned on explosion of not several weakened HCL drops corrosive exhibiting flavonoids existence.

**Test for Triterpenoids and Terpenoids:**
**Test of Salkowski**
Concentrate blended 30mg with chloroform 5 mL and have been heated over 20 mins. Moreover, the organization chloroform has been then treated by little amount of concentrated corrosive and suitably it blended. Moreover, red tone existence exhibits triterpenoids existence. On the other dimension, methanolic concentrate 1ml of instance has been overflowed with chloroform 2 ml, cooled; where 1-2 concentrated drops of sulphuric corrosive have been gradually incorporated in entire cylinder mass.

**Liebermann test**
The extricate methanol 1 ml, and chloroform with 1ml, acidic anhydride 2-3mL and 1-2 concentrated corrosive sulphuric drops have been incorporated. The red or pink tinge has been exhibited with terpenoid existence.

**Free Anthraquinones:**
Each extricate plant as an instance of 5g has been shaken with benzene 10 ml and shifted. Ammonium of 10% and 5ml of hydroxide organization has been accumulated for filtrating and blend has been shaken. The pink, violet, orelse red tone existence in ammonical phase has been considered as anthrquinones existence.

**Phenolic Compounds Test:**
**Test for Lead acetate:**
Concentrate of 10mg has been considered and lead acetic acid of 1 % with 0.5mL derivation organization has been incorporated and the improvement of hasten exhibits the phenolic and tannins mixes presence.

**Tannins:**
**Ferric chloride test:**
Concentrate 5mg has been considered and ferric chloride of 5% of 0.5 mL has been incorporated. Moreover, upgradation of tone blue dark exhibits tannins existence.

**Test for sterols and steroids:**
**Test Salkowski’s:**
Concentrate 5mg has been uncombined in chloroform 2 mL and equivalence concentrated volume corrosive sulphuric has been incorporated at test tube edges. The red color has been upper layer and yellow has been turned at lower layer with fluorescence green, exhibiting the existence of sterols and steroids compound.

**Test aimed at Glycosides and Cardiacglycosides:**
**Glycoside test:**
Concentrate 0.5mg has been broken down water 1 mL and afterward NaOH fluid organization has been incorporated. Yellow tone development exhibits the glycosides existence.

**OUTCOMES:**
**Some Physical Characteristics and Extraction of Fractional of Plant Extracts**
The ethanol, n-hexane, and chloroform dried extricates possess waxy gel occurrence though, which methanol is having semi-robust fluid occurrence. There were 4 unrefined concentrates have been earthy ruddy colored tone regardless of the reality that, profundity has been signifying distinction. Moreover, outcome from several unrefined concentrates have been proposed under table 1.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Solvent</th>
<th>Mass Extraction</th>
<th>% extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>n-hexane</td>
<td>10.10</td>
<td>1.48</td>
</tr>
<tr>
<td>2</td>
<td>Chloroform</td>
<td>15.78</td>
<td>2.32</td>
</tr>
<tr>
<td>3</td>
<td>Ethanol</td>
<td>38.92</td>
<td>5.72</td>
</tr>
<tr>
<td>4</td>
<td>Methanol</td>
<td>105.70</td>
<td>15.54</td>
</tr>
</tbody>
</table>

*Table 1: Sample weight extracted and outcomes of Percentage of crude mines of CA root.*

**Preliminary Phytochemical Test Results**

Table 2 below shows the phytochemical profile of Calpurnia aurea root extract.

![Figure 1: Preliminary phytochemical tests of Flavonoids (a), (c) and (d), Phenolic compounds (b), steroids and polyphenols (e), Cardiac glycosides (f) of the root extract of Calpurnia aurea.](image)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Phytochemicals</th>
<th>Standard Tests</th>
<th>Extracting the Solvent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>n-hexane</td>
</tr>
<tr>
<td>1</td>
<td>Alkaloids</td>
<td>Test of Dragendorff’s</td>
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<tr>
<td></td>
<td></td>
<td>Test of Mayer’s</td>
<td>-</td>
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<tr>
<td></td>
<td></td>
<td>Test of Wagner’s</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test of Hager’s</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Flavonoids</td>
<td>Test of Lead acetate</td>
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<tr>
<td></td>
<td></td>
<td>NaOH Test</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test of Shinoda’s</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Cardiac Glycosides</td>
<td>Test of Salkowski’s</td>
<td>++</td>
</tr>
<tr>
<td></td>
<td>and Glycosides</td>
<td>Test of Liebermann’s</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test of Keller-Killiani’s</td>
<td>++</td>
</tr>
<tr>
<td>4</td>
<td>Triterpenoids</td>
<td>LB Test</td>
<td>-</td>
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<tr>
<td></td>
<td>and Terpenoids</td>
<td>Test of Salkowski’s</td>
<td>+</td>
</tr>
<tr>
<td>5</td>
<td>Tannins</td>
<td>Test of Braemer’s</td>
<td>+</td>
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<tr>
<td></td>
<td></td>
<td>Test of Lead acetate</td>
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<tr>
<td>6</td>
<td>Anthocyanins</td>
<td>Test of Borntrager’s</td>
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<tr>
<td>7</td>
<td>Saponins</td>
<td>Test of Foam</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Compounds of Phenolic</td>
<td>Test of FC</td>
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<tr>
<td></td>
<td></td>
<td>Test of Lead acetate</td>
<td>-</td>
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<tr>
<td></td>
<td></td>
<td>Test NaOH</td>
<td>-</td>
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<tr>
<td>9</td>
<td>Phytosterols</td>
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<tr>
<td></td>
<td>and Steroids</td>
<td>Test of Salkowski’s</td>
<td>+</td>
</tr>
</tbody>
</table>

+++ Strongly detected; ++ moderately detected; + Detected but weak; − Negative or Not Detectable

**Discussion**

In this contemporary examination, nevertheless, the degree has been divergent in design, mainly entire phytochemicals screened, apart from anthocyanins, saponins and tannins, are available in greater than 1
dissolvable focus of CA 15-17 root. Since, the investigation has not covered glycosides cardiovascular, polyphenols, and phenols, saponins have been exhibited positive result in one triterpenoids, steroids, terpenoids, and phytosterols signified feeble outcome positive in entire instances [18] [19]. In against, anthraquinones have been neglected for exhibiting the positive outcomes in each concentrate unrefined. According to this investigation, CA methanol concentrate root provide significant increment rate outcome and succeeded by ethanol since opposed to extricate n-hexane exhibiting that root separate comprised more polar combinations than the compounds non-polar [20-25]. The portions of plant root of several 4 dissolvable concentrates have been identified as glycosides cardiovascular, flavonoids, alkaloids, saponins, and many more. In any instance, since outcome data examination uncovered, there has been in against in substance level of these dependent phytochemicals on solvents utilized aimed at extraction of test. Also, screening test phytochemical outcomes have uncovered, which cardiovascular glycosides were the significant grounded detected sections in plant specifies root part approximate to which tannins and flavonoids have been identified emphatically.

**Conclusion**

The CA therapeutic plant root extricate offers an wealthy impression in metabolites auxiliary, since the equivalent, which projected by several creators on divergent plant species. For instance, leaves and seeds usually utilized in medication customary for battling and fixing infirmities in divergent, for instance, sickness, diabetes, runs, trachoma, contagious infection, and several swellings.

**References**

